

Results of Micrometer Measures of Double Stars made with the 28-inch Refractor at the Royal Observatory, Greenwich, in the year 1907.

(Communicated by the Astronomer Royal.)

The measures were made with a bifilar position-micrometer on the 28-inch refractor, focal length 28 feet. The power generally employed was 670. When bright stars were observed a blue glass shade was usually employed to diminish the light and irradiation. The initials in the last column are those of the observers, viz.—

L.	Mr. Lewis.	W.B.	Mr. Bowyer.
B.	Mr. Bryant.	H.F.	Mr. Furner.

The stars have been observed from a working catalogue containing all the G. W. Hough stars within the working zone, and a number of miscellaneous stars showing motion, or for which observations are required.

Some of these being wide pairs of no immediate interest, the present list of measures is confined to stars of which the separation is under 4", or which show orbital motion.

Stars observed but not included in this List.

Struve Stars.

Σ 183 AC	Σ 1158 AB	Σ 1384	Σ 1541	Σ 2185 AB	Σ 2524
1000	1158 AC	1426 AC	1555 AC	2185 AC	2690 AB
1100	1158 AD	1468	1585	2220	2704 AD
	1158 AE	1481 AB	1612	2434	2709
	1196 AC	1481 AC	2140	2458	2725
	1196 BC	1507			

G. W. Hough Stars.

Ho. 494	Ho. 337 AB	Ho. 387	Ho. 423	Ho. 274	Ho. 597
495	21	547	269	115	604
8	28	406 AB	433	116	475 AC
11	29	552	434	586	476
316	523 AB	553	91	117	478
219	348	409	446	588 AB	191 AC
501	349	557	445	588 AC	302 BC
325	38	416	448	593	204
327	259	419	450	131	
508	543	561	451	145	

Royal Observatory, Greenwich :
1908 May 5.

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Star's Name.	R.A. 1910. h m	N.P.D. 1910. ° ' "	Posi- tion Angle.	Dis- tance.	No. of Nights.	Mags.	Epoch 1907.	Obs.
Hu. 405 ...	0 12	65 57	275°5	1"18	4	9.3 9.5	'902	W.B.
β 1093 ...	0 16	79 31	69°5	0.33	1	7.3 8.2	'827	B.
β 779 ...	0 23	66 55	257°3	1.04	1	8.5 9.0	'827	B.
Ho. 212 ...	0 31	94 5	245°0	0.31	1	6.0 6.0	'827	B.
Hu. 411 ...	0 33	67 30	102°7	0.65	1	8.5 8.5	'925	W.B.
Hu. 413 ...	0 42	67 15	241°7	0.80	1	8.0 9.2	'925	W.B.
Ho. 306 ...	0 43	64 56	163°7	1.19	1	8.5 8.8	'044	W.B.
Ho. 4 ...	0 46	56 33	200°4	1.57	3	9.0 9.0	'592	W.B.
Σ 73 ...	0 50	66 52	28°2	1.13	1	6.2 6.8	'827	B.
			29°9	0.85	2	...	'864	W.B.
Ho. 307 ...	0 52	58 17	86°5	2.76	1	9.5 9.7	'044	W.B.
Σ 113 ...	1 15	91 0	355°2	1.33	1	6.2 7.2	'827	B.
Ho. 9 ...	1 24	68 45	94°8	2.44	3	9.0 10.0	'592	W.B.
Σ 138 ...	1 31	82 50	33°1	1.62	1	7.3 7.3	'827	B.
Σ 158 ...	1 42	57 18	257°7	1.90	2	8.3 8.8	'864	W.B.
Σ 183 AB ...	1 50	61 39	1°6	0.45	1	7.5 8.2	'827	B.
Hu. 1033 ...	1 50	54 6	234°4	0.85	1	8.5 8.8	'044	W.B.
Σ 186 ...	1 51	88 37	35°1	0.73	1	7.2 7.2	'827	B.
Σ 208 ...	1 59	64 31	91°2	0.48	1	6.2 8.4	'058	W.B.
			78°6	0.58	1	...	'162	H.F.
Ait. 959 ...	2 13	59 9	360°7	3.84	3	9.0 12.0	'342	W.B.
Ait. 962 ...	2 16	60 28	76°6	0.53	1	8.9 9.2	'162	H.F.
Σ 305 ...	2 42	71 1	316°3	3.22	1	7.3 8.2	'104	H.F.
			315°4	3.19	3	...	'673	W.B.
Ho. 317 ...	2 52	73 7	304°3	3.46	2	8.1 11.0	'867	W.B.
Ho. 500 ...	3 6	54 15	222°1	0.68	1	8.5 9.0	'162	H.F.
Ho. 502 ...	3 9	54 36	19°5	0.77	1	8.5 9.0	'162	H.F.
Hu. 1058 ...	3 19	50 6	114°7	0.75	2	7.8 8.5	'192	H.F.
Ait. 979 ...	3 20	59 35	270°9	1.48	2	9.2 10.0	'482	W.B.
Ho. 322 ...	3 20	44 43	124°1	1.90	1	9.2 9.5	'222	H.F.
Ait. 983 ...	3 26	60 40	304°1	0.49	1	8.5 9.2	'162	H.F.
Ait. 987 ...	3 37	60 30	7°6	1.09	3	9.6 9.7	'347	W.B.
Hu. 103 ...	3 39	40 25	203°1	1.01	1	8.1 8.4	'222	H.F.
Ho. 504 ...	3 39	54 26	188°3	0.98	1	7.8 8.0	'893	W.B.
Hu. 815 ...	3 51	68 29	204°7	2.45	3	8.0 11.3	'324	W.B.
Ho. 505 ...	3 53	57 30	194°9	1.23	1	8.0 10.0	'044	W.B.
Σ 483 ...	3 58	50 43	223°6	0.53	2	8.0 9.5	'192	H.F.
β 1277 ...	4 0	61 51	300°7	0.75	1	8.0 12.2	'227	L.

May 1908. *the Royal Observatory, Greenwich, in 1907.* 527*Micrometer Measures of Double Stars—continued.*

Star's Name.	R.A. 1910. h m	N.P.D. 1910. ° ' "	Position Angle	Dis- tance.	No. of Nights	Mags.	Epoch 1907.	Obs.
β 1005 ...	4 1	61 18	64°2	2°40	1	8.5 11.7	'189	L.
β 1232 ...	4 3	61 3	188°2	0°43	2	8.4 9.3	'208	L.
Espin 278 ...	4 3	50 3	172°4	2°34	2	7.7 9.2	'192	H.F.
Ho. 326 ...	4 4	61 35	165°7	0°49	2	8.0 8.0	'208	L.
O Σ 77 ...	4 10	58 32	197°8	0°28	1	7.5 7.5	'227	L.
Ho. 15 ...	4 19	60 5	150°8	0°76	2	8.0 8.0	'492	W.B.
			151°9	0°70	1	...	'162	H.F.
β 1044 ...	4 35	73 39	219°8	0°66	1	9.0 11.0	'189	L.
Ho. 333 ...	4 38	69 55	164°9	2°75	1	9.2 9.3	'104	H.F.
Ho. 224 AB	4 59	61 24	281°5	1°70	1	9.0 10.7	'159	W.B.
Ait. 1024 ...	4 59	60 30	349°5	0°80	1	8.1 8.9	'227	L.
			355°9	0°56	2	...	'932	W.B.
Ait. 1026 ...	4 59	60 9	38°4	1°06	2	7.8 11.0	'492	W.B.
O Σ 95 ...	5 0	70 19	327°2	0°84	1	6.6 7.2	'189	L.
Ait. 1028 ...	5 1	60 3	238°6	0°45	1	8.5 9.1	'939	W.B.
Hu. 217 ...	5 24	54 42	259°0	0°61	2	7.0 8.5	'192	H.F.
Σ 749 ...	5 32	63 8	170°0	0°78	1	7.0 7.1	'175	B.
			172°7	0°97	1	...	'925	W.B.
Ait. 1040 ...	5 39	58 44	130°8	0°74	1	8.2 9.3	'222	H.F.
Ho. 337 BC	5 50	66 44	110°5	1°23	1	9.0 9.2	'159	W.B.
Ho. 23 ...	6 9	75 31	243°9	2°74	1	8.2 12.0	'159	W.B.
Ho. 239 ...	6 45	75 12	130°7	0°51	3	8.3 8.3	'177	W.B.
Ait. 1061 ...	6 54	64 49	321°3	0°40	2	8.2 8.5	'151	W.B.
Espin 289	6 57	50 54	101°8	2°04	1	9.4 9.7	'230	W.B.
Ho. 342 ...	6 58	76 46	83°7	1°39	1	8.0 8.8	'159	W.B.
Σ 1037 ...	7 7	62 37	299°2	0°52	1	7.1 7.1	'241	W.B.
Ho. 33 ...	7 15	67 40	326°4	2°95	1	9.0 12.0	'236	W.B.
Ho. 36 ...	7 42	64 19	120°6	0°57	1	8.5 8.5	'159	W.B.
Ho. 250 ...	7 52	68 48	153°1	0°54	3	7.0 9.0	'210	W.B.
Σ 1187 ...	8 4	57 31	41°9	2°23	2	7.1 8.0	'243	W.B.
Σ 1196 AB	8 7	72 4	340°3	1°21	2	5.0 5.7	'151	W.B.
			341°7	1°19	1	...	'222	H.F.
Hu. 1123 ...	8 9	53 14	155°7	0°36	2	8.5 8.8	'236	W.B.
Hu. 626 ...	8 14	57 23	153°6	3°39	1	8.0 12.0	'356	W.B.
Ho. 525 ...	8 18	69 42	150°7	0°55	3	8.5 8.5	'242	W.B.
Hu. 627 ...	8 25	55 10	264°3	1°01	1	9.0 10.0	'356	W.B.
Σ 1273 AC	8 42	83 12	241°8	3°07	1	3.8 7.8	'260	H.F.
Espin 294 ...	8 43	53 31	160°2	1°70	2	9.0 9.2	'276	W.B.

Micrometer Measures of Double Stars—continued.

Star's Name.	R.A. 1910. h m	N.P.D. 1910. ° ' "	Posi- tion Angle.	Dis- tance.	No. of Nights	Mags.	Epoch 1907.	Obs.
Hu. 861 ...	8 53	75 25	20°9	0"28	1	8.5 9.1	'241	W.B.
Hu. 718 ...	8 55	57 13	192°0	0.41	2	8.7 8.9	'299	W.B.
Σ 3121 ...	9 13	61 3	35°0	0.43	3	7.5 7.8	'242	W.B.
Ho. 42 ...	9 9	56 4	7°9	1.62	1	9.5 9.5	'255	W.B.
Σ 1333 ...	9 13	54 15	47°4	1.60	1	6.6 6.9	'323	L.
Σ 1334 ...	9 13	52 48	239°1	2.91	1	4.0 6.7	'323	L.
Ho. 43 ...	9 14	68 48	298°0	0.31	1	8.0 8.5	'230	W.B.
Ho. 364 ...	9 14	66 42	332°9	3.87	1	8.2 11.2	'219	W.B.
Σ 1348 ...	9 20	83 12	318°5	1.81	2	7.5 7.6	'225	W.B.
Σ 1355 ...	9 22	83 19	329°2	2.24	2	7.2 7.2	'282	H.F.
Σ 1372 ...	9 32	73 19	56°4	0.69	2	8.2 8.3	'282	H.F.
Σ 1374 ...	9 35	50 35	286°6	3.27	1	7.0 8.3	'296	W.B.
			288°3	2.95	1	...	'334	H.F.
Ho. 369 ...	9 46	53 5	275°5	0.37	1	7.7 7.8	'323	L.
Σ 1389 ...	9 47	62 32	306°4	1.99	2	8.0 9.0	'277	W.B.
			308°2	2.65	1	...	'260	H.F.
			307°7	2.19	1	...	'323	L.
Σ 1406 ...	10 0	58 26	228°3	0.98	1	8.0 8.7	'334	H.F.
Σ 1413 ...	10 7	73 9	96°0	2.18	2	8.9 8.9	'282	H.F.
			97°6	1.90	1	...	'296	W.B.
Σ 1420 ...	10 13	50 24	327°5	2.24	1	8.2 9.9	'296	W.B.
Hu. 875 ...	10 13	52 2	64°1	1.05	1	7.0 9.8	'356	W.B.
Σ 1423 ...	10 14	68 56	57°7	1.23	1	8.6 9.3	'304	H.F.
Σ 1426 AB	10 16	83 4	283°0	0.72	2	7.5 8.0	'282	H.F.
OΣ 218 ...	10 23	85 56	79°1	0.78	2	8.2 9.7	'282	H.F.
Σ 1439 ...	10 25	68 44	113°0	1.94	4	8.0 8.5	'238	W.B.
			114°0	1.83	1	...	'260	H.F.
Σ 1457 ...	10 34	83 46	314°8	1.28	2	7.6 8.5	'282	H.F.
Σ 1476 ...	10 44	93 30	181°7	2.18	2	7.2 8.0	'319	H.F.
Σ 1500 ...	10 55	92 56	308°1	1.24	2	7.6 8.2	'319	H.F.
Σ 1517 ...	11 9	69 19	87°1	0.34	2	7.3 7.3	'301	B.
			84°0	0.45	2	...	'370	W.B.
Σ 1523 ...	11 13	57 54	131°6	2.86	1	4.0 5.0	'296	W.B.
			131°6	2.68	1	...	'334	H.F.
Σ 1525 ...	11 14	41 58	176°8	1.64	1	9.0 9.0	'392	H.F.
Σ 1536 ...	11 19	78 58	49°2	2.21	2	3.9 7.1	'301	B.
Σ 1537 ...	11 20	68 52	355°3	2.80	1	7.6 8.6	'219	W.B.
Σ 1555 AB	11 31	61 40	353°1	0.39	2	6.4 6.8	'301	B.

Micrometer Measures of Double Stars—continued.

Star's Name.	R.A. 1910.		N.P.D. 1910.	Posi- tion Angle.	Dis- tance.	No. of Nights	Mags.		Epoch 1907.	Obs.
	h	m								
Hu. 888 ...	11	38	68 25	320°1	0°69	3	8.4	8.9	'301	W.B.
Σ 1581 ...	11	51	43 53	172°0	2°04	1	8.3	9.5	'392	H.F.
Σ 1589 ...	11	55	45 50	161°3	1°94	1	9.0	9.5	'392	H.F.
Σ 1606 ...	12	6	49 33	328°7	1°06	1	6.3	7.0	'392	H.F.
Σ 1639 ...	12	20	63 55	351°3	0°36	2	6.7	7.9	'301	B.
Σ 1643 ...	12	23	62 28	34°7	2°15	1	8.7	9.2	'348	W.B.
				37°6	2°20	1	...		'438	L.
Σ 1647 ...	12	26	79 47	224°4	1°46	3	7.5	7.8	'308	W.B.
Hu. 892 ...	12	38	74 59	163°8	1°01	2	9.3	9.3	'301	B.
Hu. 893 ...	12	43	77 13	33°9	1°55	2	9.1	9.1	'301	B.
Hu. 894 ...	12	49	76 20	144°4	1°02	2	9.1	9.1	'301	B.
OΣ 256 ...	12	52	90 24	76°6	0°60	2	7.2	7.6	'301	B.
OΣ 261 ...	13	8	57 26	346°9	1°66	2	6.9	7.4	'301	B.
OΣ 269 ...	13	29	54 38	215°6	0°35	2	6.5	7.0	'319	B.
OΣ 278 ...	14	9	45 24	82°5	0°24	3	7.5	7.7	'514	B.
Ho. 541 ...	14	16	77 25	96°6	2°16	2	9.3	10.2	'388	W.B.
Σ 1834 ...	14	17	41 5	343°2	0°14	2	7.1	7.2	'319	B.
Ho. 542 ..	14	23	68 59	264°9	0°58	2	8.8	8.8	'301	B.
Σ 1865 ...	14	37	75 53	145°9	0°43	4	3.5	3.9	'339	B.
OΣ 285 ...	14	42	47 14	110°6	0°32	4	7.1	7.6	'463	B.
OΣ 287 ...	14	48	44 42	321°7	0°79	4	7.5	7.6	'463	B.
Ho. 389 ...	14	48	69 20	98°3	1°46	1	7.0	9.3	'427	W.B.
OΣ 288 ...	14	49	73 56	188°0	1°79	2	6.4	7.1	'340	W.B.
				185°9	1°61	1	...		'400	L.
Σ 1932 ...	15	14	62 50	164°5	0°72	1	5.6	6.1	'400	L.
Σ 1944 ...	15	23	83 36	324°0	1°25	1	7.5	8.1	'427	W.B.
Σ 1954 ...	15	31	79 9	185°5	3°68	2	3.2	4.1	'384	W.B.
OΣ 298 ...	15	33	49 54	191°5	1°11	2	7.0	7.3	'607	B.
Σ 1967 ...	15	39	63 25	113°3	0°63	1	4.0	7.0	'400	L.
OΣ 303 ...	15	57	76 28	145°2	0°84	1	7.4	7.9	'427	W.B.
Σ 2021 ...	16	9	76 14	336°6	3°84	2	6.7	6.9	'384	W.B.
Σ 2026 ...	16	12	82 24	187°9	0°50	1	8.6	9.1	'496	L.
				189°4	0°49	1	...		'498	W.B.
OΣ 309 ...	16	16	48 7	64°3	0°42	3	7.5	7.8	'502	B.
Σ 2049 ...	16	24	63 49	204°0	1°17	1	6.5	7.5	'400	L.
Hu. 483 ...	16	24	68 54	295°0	1°59	2	8.2	13.0	'529	W.B.
Σ 2052 ...	16	25	71 24	271°0	1°14	1	7.5	7.5	496	L.
				269°8	1°27	2	...		'505	W.B.

Micrometer Measures of Double Stars—continued.

Star's Name.	R.A. 1910. h m	N.P.D. 1910. ° ' "	Posi- tion Angle.	Dis- tance.	No. of Nights	Mags.	Epoch 1907.	Obs.
Σ 2055 ...	16 26	87 49	62°4	1"27	7	4.0 6.1	'524	W.B.
Hu. 487 ...	16 38	67 58	28.9	0.51	2	9.0 9.0	'559	B.
Σ 2084 ...	16 38	58 14	169.3	1.04	4	3.0 6.5	'554	B.
			163.4	1.08	2	...	'419	L.
			168.5	1.31	3	...	'558	W.B.
Σ 2091 ...	16 39	48 38	120.9	0.89	2	7.5 8.0	'604	W.B.
OΣ 315 ...	16 46	88 37	152.1	0.65	3	6.2 8.1	'544	W.B.
Σ 2106 ...	16 47	80 26	298.4	0.19	1	6.7 8.4	'578	B.
Ait. 1142	16 53	75 8	305.5	1.69	1	8.7 12.7	'630	L.
Σ 2114 ...	16 58	81 25	160.7	1.18	3	6.2 7.4	'495	W.B.
Hu. 1176 ...	17 5	53 57	111.7	0.15	3	6.0 6.0	'686	B.
Σ 2132 ...	17 7	93 56	112.0	1.43	1	8.3 9.0	'545	H.F.
Hu. 170 ...	17 8	80 8	278.4	1.88	1	8.5 10.8	'575	W.B.
Ho. 414 ...	17 19	63 50	88.5	0.60	2	8.4 8.8	'723	W.B.
Ho. 415 ...	17 19	64 10	332.9	0.96	2	8.0 8.7	'723	W.B.
Hu. 1179 ...	17 21	51 20	274.5	0.22	4	7.0 7.1	'655	B.
Σ 2171 ...	17 24	99 55	67.9	1.69	3	7.5 7.6	'559	B.
Σ 2173 ...	17 25	90 59	312.3	0.49	3	6.0 6.3	'559	B.
Ho. 417 ...	17 26	51 59	152.4	0.38	3	8.0 8.0	'635	B.
Hu. 179 ...	17 27	78 43	55.4	2.01	1	8.8 8.9	'471	W.B.
Ho. 420 ...	17 35	52 58	107.9	1.48	2	9.3 9.6	'626	B.
Σ 2205 ...	17 40	72 14	306.3	2.01	4	8.0 8.7	'501	W.B.
Σ 2215 ...	17 41	72 15	285.7	0.81	3	5.9 7.9	'511	W.B.
Σ 2220 BC	17 42	62 13	80.1	1.14	2	9.5 10.5	'526	H.F.
= AC 7			79.6	1.28	1	...	'630	L.
OΣ 338 ...	17 48	74 39	14.0	0.76	1	6.6 6.9	'712	B.
Ho. 442 ...	17 48	95 18	94.7	3.60	3	8.2 9.0	'566	W.B.
Ait. 235 ...	17 49	65 0	78.5	0.33	1	7.9 8.1	'712	B.
β 1299 ...	17 52	79 0	154.2	0.42	1	8.5 8.5	'712	B.
Σ 2262 ...	17 58	98 11	259.8	1.78	2	5.0 5.7	'526	H.F.
OΣ 534 ...	18 1	68 34	273.6	2.11	2	7.5 9.5	'549	B.
Σ 2272 ...	18 1	87 28	164.5	2.62	16	4.5 6.0	'595	W.B.
OΣ 341 ...	18 2	68 34	92.0	0.37	3	6.4 7.7	'565	B.
OΣ 524 ...	18 4	70 21	56.7	0.39	3	7.0 8.3	'600	W.B.
Σ 2283 ...	18 5	83 52	82.2	0.90	4	7.2 7.7	'568	B.
Hu. 314 ...	18 5	71 23	152.1	0.56	3	8.3 8.5	'600	W.B.
Hu. 315 ...	18 5	66 27	46.8	0.43	3	9.3 9.3	'675	W.B.
Σ 2289 ...	18 6	73 32	229.3	1.15	4	6.0 7.1	'518	W.B.

Micrometer Measures of Double Stars—continued.

Star's Name.	R.A. 1910.	N.P.D. 1910.	Posi- tion Angle.	Dis- tance.	No. of Nights	Mags.	Epoch 1907.	Obs.
	h m	° ' "		"				
Σ 2294 ...	18 9	89 51	281°3	0°53	2	7·4 7·7	·526	H.F.
Ho. 430 ...	18 18	69 32	194°7	2°93	1	8·5 9·0	·687	L.
Lewis 20 ...	18 18	69 30	332°1	2°32	1	9·0 9·5	·687	L.
* ...	18 18	70 2	138°0	3°77	1	10·5 11·0	·687	L.
Hu. 581 ...	18 19	75 5	130°2	0°30	2	8·4 9·0	·654	B.
			122°5	0°38	3	...	·706	W.B.
Ho. 83 ...	18 20	62 32	268°2	0°61	2	8·8 8·8	·583	W.B.
... ..			75°3	0°56	1	...	·687	L.
Σ 2320 ...	18 24	65 25	4°7	1°54	3	7·1 9·0	·495	W.B.
OΣ 354 ...	18 28	83 17	170°6	0°82	3	7·2 8·0	·580	W.B.
OΣ 358 ...	18 32	73 6	191°2	1°86	3	6·8 7·2	·533	W.B.
Hu. 198 ...	18 34	81 15	189°1	0°15	1	8·5 8·6	·657	W.B.
Ho. 437 AB	18 37	58 27	120°2	0°43	3	8·3 8·5	·739	W.B.
... CD			339°4	3°55	2	11·2 11·7	·731	W.B.
Ho. 88 ...	18 41	99 38	211°1	2°31	1	9·0 9·0	·578	B.
Σ 2375 ...	18 41	84 36	112°5	2°32	3	6·2 6·6	·517	W.B.
Σ 2422 ...	18 54	64 2	92°7	0°67	2	7·6 7·7	·529	W.B.
β 648 ...	18 54	57 13	179°0	0°42	1	6·0 9·5	·687	L.
			182°2	0°51	2	...	·731	W.B.
Hu. 330 ...	18 55	70 31	28°4	0°77	2	9·0 9·3	·742	W.B.
* ...	18 55	70 32	293°0	2°42	1	9·5 10·5	·668	L.
Hu. 678 ...	18 56	77 54	360°2	2°98	2	8·0 10·5	·507	W.B.
Ho. 92 ...	18 57	57 37	39°5	1°12	2	9·0 9·1	·762	W.B.
Σ 2437 ...	18 58	70 58	58°5	0°80	2	7·8 8·0	·507	W.B.
Ho. 93 ...	18 58	75 42	329°3	1°13	4	7·7 12·0	·711	W.B.
Σ 2455 ...	19 3	67 58	68°8	4°00	1	7·2 8·3	·668	L.
			72°4	3°73	3	...	·698	W.B.
* ...	19 3	67 8	296°2	3°73	1	9·5 10·0	·668	L.
			291°7	4°03	1	...	·715	W.B.
Ho. 444 ...	19 5	63 14	76°7	1°36	3	8·4 10·0	·620	W.B.
Ho. 98 ...	19 5	63 3	146°2	0°31	4	8·0 8·0	·719	W.B.
Ho. 442 ...	19 5	70 55	94°7	3°60	3	9·0 10·5	·566	W.B.
* ...	19 5	62 27	87°5	2°95	1	9·0 9·5	·668	L.
* ...	19 5	62 27	78°5	3°08	1	9·0 10·0	·668	L.
Ho. 447 ...	19 13	62 14	174°4	1°93	3	9·5 9·5	·593	W.B.
Ho. 103 ...	19 14	93 37	246°6	2°45	1	9·2 9·2	·578	B.
Ho. 105 ...	19 18	73 31	187°5	2°65	3	8·5 10·0	·517	W.B.
Hu. 339 ...	19 21	71 32	45 9	0°59	5	8·6 8·6	·596	W.B.

Micrometer Measures of Double Stars—continued.

Star's Name.	R.A. 1910.		N.P.D. 1910.	Posi- tion Angle.	Dis- tance.	No. of Nights	Mags.		Epoch 1907.	Obs.
	h	m	°							
Ho. 450 AB	19	23	51 22	267°6	0"97	1	8.0	8.7	.928	H. F.
Σ 2525 ...	19	23	64 52	305°2	0.67	5	7.5	7.7	.558	W. B.
Hu. 340 ...	19	24	71 43	119°9	0.87	4	9.0	9.3	.609	W. B.
Hu. 949 ...	19	30	57 5	103°0	0.69	1	8.6	9.0	.928	H. F.
Ho. 108 ...	19	30	56 43	47°9	0.54	1	8.0	8.0	.928	H. F.
Ho. 110 ...	19	35	71 31	80°5	2.67	3	9.5	9.5	.679	W. B.
Hu. 953 ...	19	36	54 58	177°0	1.08	2	8.6	9.0	.762	W. B.
Ho. 112 ...	19	37	71 35	70°2	2.72	3	9.0	9.0	.675	W. B.
Σ 2576 ..	19	42	56 38	287°9	2.45	2	7.8	7.8	.762	W. B.
AGC 11 ...	19	45	71 5	140°4	0.19	3	5.5	6.5	.705	B.
Σ 2596 ...	19	50	74 59	322°0	2.02	3	7.2	8.6	.692	W. B.
* ...	19	50	67 47	81°8	3.12	1	10.5	10.5	.657	W. B.
Σ 2600 ...	19	51	67 47	56°4	3.09	3	8.3	9.7	.673	W. B.
BD + 21°										
3994 AB	19	54	68 6	275°7	1.32	3	9.0	10.4	.713	W. B.
				277°8	1.33	1	...		.928	H. F.
BD + 21°3996	19	55	68 11	298°9	1.94	3	9.0	9.5	.694	W. B.
Σ 2607 AB										
= OΣ 392	19	55	48 1	292°1	0.65	1	7.2	9.0	.928	H. F.
Ho. 583 ...	19	55	68 8	256°0	1.21	1	9.0	10.7	.767	W. B.
Ho. 118 ...	19	59	56 35	22°7	2.74	2	9.1	11.0	.762	W. B.
Ait. 1194 ...	20	0	77 54	305°1	0.62	1	8.9	9.0	.750	B.
				299°6	0.80	1	...		.767	W. B.
Ho. 122 ...	20	11	61 37	75°4	1.10	1	9.0	9.7	.756	W. B.
Ho. 591 ...	20	14	62 23	294°0	2.30	2	9.5	10.0	.655	W. B.
* ...	20	16	51 16	198°6	1.95	1	7.0	11.3	.928	H. F.
Ho. 126 ...	20	16	51 18	152°3	2.86	1	9.7	9.7	.928	H. F.
Hu. 1198 ...	20	20	77 17	32°8	0.65	1	8.4	9.2	.835	H. F.
Ho. 457 ...	20	21	60 55	60°0	2.13	3	8.1	8.1	.692	W. B.
Σ 2690 BC	20	27	79 5	217°2	0.41	2	7.5	7.5	.731	B.
Ho. 133 ...	20	28	103 51	184°3	0.87	1	8.0	8.0	.750	B.
Ho. 134 ...	20	32	55 9	203°2	3.36	2	8.5	8.7	.762	W. B.
β 151 ...	20	33	75 45	125°5	0.25	4	4.7	6.1	.730	B.
Ho. 458 ...	20	35	61 10	279°0	2.12	3	9.0	9.1	.673	W. B.
Σ 2716 ...	20	37	58 3	49°7	2.65	1	6.0	8.2	.835	H. F.
Hu. 690 ...	20	41	56 11	290°1	0.93	1	9.0	9.2	.928	H. F.
Σ 2723 ...	20	42	74 28	103°4	1.37	3	7.3	8.0	.692	W. B.
Ho. 141 ...	20	43	71 2	291°0	1.16	1	8.4	10.8	.619	W. B.

Micrometer Measures of Double Stars—continued.

Star's Name.	R.A. 1910.	N.P.D. 1910.	Posi- tion Angle.	Dis- tance.	No. of Nights	Mags.	Epoch 1907.	Obs.
	h m	° ' "		"				
Ho. 144 ...	20 48	70 13	164°9	0'43	1	7.0 7.0	'657	W.B.
Ho. 146 ...	20 51	55 7	51.9	0.56	1	8.0 8.1	'928	H.F.
Hu. 764 ...	20 56	55 55	190.2	0.48	1	7.5 8.7	'928	H.F.
Ho. 282 ...	21 0	44 30	359.0	0.28	1	7.0 7.0	'805	B.
Hu. 767 ...	21 9	74 24	143.7	0.18	2	7.0 7.0	'738	B.
OΞ 535 ...	21 10	80 22	171.9	0.16	1	4.5 5.0	'687	L.
			158.2	[0.15]	3	...	'706	W.B.†
			95.0	0.13	3	...	'718	B.
			76.5	0.14	3	...	'848	B.
			136.0	0.11	3	...	'862	W.B.
Ho. 284 ...	21 12	74 24	90.2	3.73	2	9.0 9.3	'636	W.B.
Ho. 153 ...	21 14	56 37	121.2	0.78	1	8.0 9.0	'928	H.F.
Ho. 286 ...	21 16	52 8	304.9	0.16	1	6.0 6.0	'764	B.
Ho. 155 ...	21 16	57 8	31.7	2.02	2	8.0 9.5	'783	W.B.
Ho. 157 ...	21 19	58 22	23.1	3.69	2	7.7 7.7	'783	W.B.
Ait. 1219 ...	21 21	60 8	120.8	1.40	2	9.3 9.4	'762	W.B.
Ait. 1220 ...	21 21	58 54	145.5	1.73	2	8.5 9.0	'762	W.B.
Ho. 160 ...	21 25	47 29	178.9	1.72	1	8.3 9.0	'928	H.F.
Hu. 371 ...	21 31	65 57	162.1	0.22	3	7.0 7.5	'742	B.
Hu. 372 ...	21 34	66 48	149.6	0.30	3	9.0 9.0	'742	B.
Hu. 280 ...	21 38	84 30	134.6	0.18	3	7.7 8.1	'742	B.
Hu. 374 ...	21 39	66 32	32.8	0.33	3	9.0 9.0	'742	B.
Ho. 605 ...	21 40	55 32	344.0	2.09	1	9.2 9.9	'942	L.
β 989 ...	21 41	64 46	95.1	0.19	9	4.8 5.3	'806	W.B.
			93.1	0.08	1	...	'687	L.
			97.6	0.13	5	...	'735	B.
Ho. 166 ...	21 46	62 34	75.3	0.34	2	7.5 7.5	'782	W.B.
Ho. 169 ...	21 46	54 19	137.1	3.18	1	8.0 12.0	'942	L.
Ho. 467 ...	21 46	68 10	182.6	1.15	2	8.0 10.2	'712	W.B.
Ho. 179 ...	22 4	60 14	261.5	0.42	1	8.0 9.0	'810	W.B.
Ho. 182 ...	22 19	72 54	128.9	1.46	3	8.5 8.5	'719	W.B.
Ξ 2900 ...	22 19	69 39	175.8	1.41	1	6.0 9.2	'942	L.
Ho. 475 ...	22 29	64 3	315.9	0.74	2	8.0 8.2	'769	W.B.
Ho. 294 ...	22 33	63 2	58.1	2.03	2	8.0 10.0	'763	W.B.
Ho. 480 ...	22 34	60 45	228.7	0.69	1	8.0 9.1	'810	W.B.

† Distance estimated.

Micrometer Measures of Double Stars—continued.

Star's Name.	R.A. 1910.		N.P.D. 1910.		Posi- tion Angle.	Dis- tance.	No. of Nights	Mags.		Epoch 1907.	Obs.
	h	m	°	'							
Ho. 296 ...	22	36	75	56	61°7	0'46	3	5.5	5.5	'742	B.
					64.0	0.33	2	...		'791	W.B.
Hu. 780 ...	22	37	75	56	13.9	0.33	3	9.2	9.4	'742	B.
					5.3	0.51	1	...		'942	L.
Σ 2934 ...	22	37	69	5	134.3	0.63	1	8.2	9.2	'942	L.
Hu. 781 ...	22	38	75	16	311.9	0.30	1	8.5	9.5	'862	W.B.
Ho. 481 ...	22	41	61	6	114.1	0.31	3	8.3	8.3	'742	B.
Ho. 190 ...	22	45	62	28	153.9	1.86	1	9.2	9.2	'810	W.B.
Ho. 482 ...	22	47	64	5	56.5	0.22	5	6.8	6.8	'772	B.
Hu. 987 ...	22	51	74	42	243.8	0.54	3	8.6	8.8	'780	B.
					252.4	0.93	1	...		'942	L.
Ho. 192 ...	22	55	60	24	30.4	1.47	2	8.5	9.5	'763	W.B.
Ho. 193 ...	22	59	60	35	165.7	2.42	1	7.2	11.2	'871	W.B.
Ho. 196 ...	23	4	60	1	288.5	1.94	1	8.0	11.0	'871	W.B.
Ho. 198 ...	23	13	73	38	32.8	2.31	3	8.0	9.0	'860	W.B.
Hu. 400 ...	23	13	72	11	229.4	0.33	3	7.4	8.8	'780	B.
Ho. 489 ...	23	22	62	47	245.0	0.45	2	7.8	7.8	'832	W.B.
Σ 3012 ...	23	23	73	55	189.9	2.99	1	8.7	8.8	'942	L.
Σ 3013 ...	23	23	73	55	273.8	3.62	1	7.8	9.3	'942	L.
Hu. 298 ...	23	28	83	25	76.1	0.28	2	6.8	7.4	'757	B.
* ...	23	36	70	8	128.2	1.60	1	8.0	11.0	'942	L.
Hu. 300 ...	23	41	84	1	119.0	1.14	3	8.7	9.0	'780	B.
					118.8	1.15	1	...		'893	W.B.
Ho. 206 ...	23	55	56	14	189.0	1.69	1	8.0	10.0	'810	W.B.

Note on "the Spanner," Captain Gadsden's Artificial Horizon for Sextants. By H. H. Turner, D.Sc., F.R.S., Savilian Professor.
(Plate 13.)

It seems desirable that the existence of an instrument which has been found to work in practice, and which is useful to a sailor in fog or at night, should be made widely known. I venture to emphasise the fact that the instrument has been found practically useful; for this point is essential. There have been many promising suggestions for such an instrument, which have failed on actual trial.

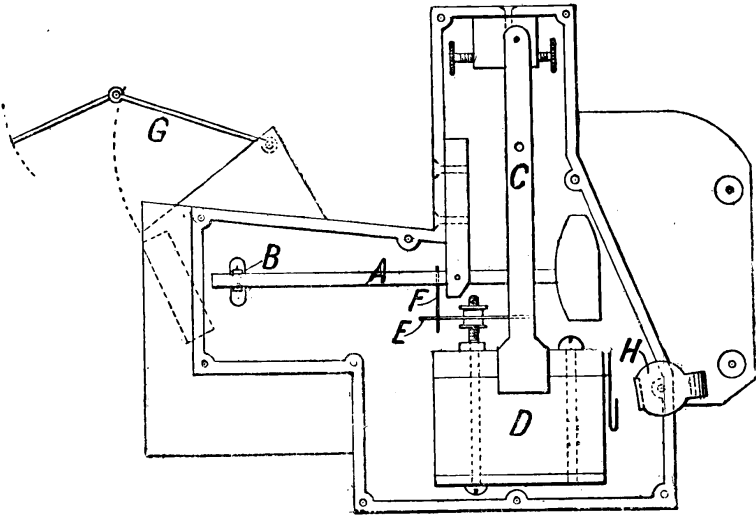
The apparatus is attached to an ordinary sextant, and is the invention of Captain H. A. Gadsden, of 6 Binden Road, Ravenscourt Park W., London, to whom I must refer those interested for further details. The subjoined figures (Plate 13) will explain its general nature. The instrument was exhibited to the Society at the April meeting.

An artificial horizon is provided, which consists of two bars that exactly span the periphery of the Sun's image in the horizon glass, and are maintained in horizontal position by means of a pendulum forming part of the attachment. This is shown in detail in Plate 13. At *A* is a pivoted balance beam which carries the horizon bars *B*, the latter extending through a slot in the casing. The pendulum comprises a pair of plates *C*, pivoted to a block at their upper ends, while their lower ends carry a heavy weight *D*. A plate *E* is secured to the weight *D*, and is formed with an opening through which extends a rod *F*, projecting from the beam *A*. The pendulum maintains its vertical position when the sextant is held in the hand, and by means of the rod *F* the horizon bars are kept at a proper horizontal level.

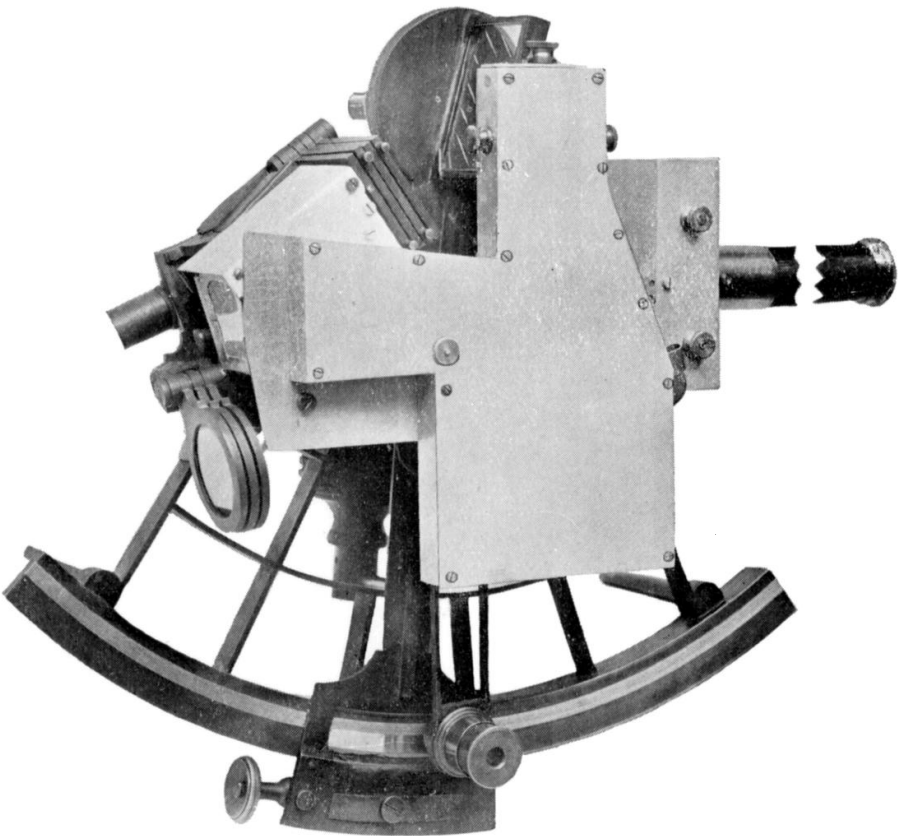
As the horizon bars are near the eye of an observer, the telescope of a sextant cannot be used. Observations are therefore made with a simple tube, longer than that usually supplied, so that the eye can be properly focussed on the bars.

If it is desired to use the sextant in the ordinary way, the spanner can be "locked" out of sight.

Captain Gadsden has also added to the sextant a stock of simple form (resembling a gunstock), which is put against the shoulder and helps to steady the instrument.



Details of the Pendulum attachment.



Sextant with Artificial horizon attachment.